JAVIER CABRERA

Computer Scientist

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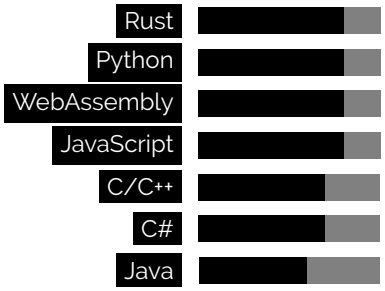
WHO AM I?

My name is Javier Cabrera, I am a WebAssembly-enthusiastic and a PhD candidate at KTH Royal Institute of Technology in Stockholm, specializing in Software Engineering, Program Synthesis and Automated Testing. With seven years of work experience in both academia and industry, I am passionate about utilizing my skills to contribute to these fields in meaningful ways.

I am currently exploring the use of Software Diversification for reliability and security, with the aim of contributing to the development of more efficient and effective software testing methodologies.
Throughout my academic and professional career, I have consistently demonstrated a strong work ethic, attention to detail, and dedication to achieving optimal results. I am excited to continue pursuing my passion for software engineering and automation, and am committed to making valuable contributions to these fields in the years to come.

PROEFICIENCY



LANGUAGES

Spanish: native, **English**: proficient, **Swedish**: rudimentary

EXPERIENCE

3/2019 – Present **Phd. student/Researcher/Teacher assistant** — **KTH Royal Institute of Technology.**

`Automatic Testing` • `Compilers` • `DevOps` • `Edge computing` • `WebAssembly` • `Rust`

I do Automated Software Testing. During this time, we have contributed to the scientific community, and we have implemented groundbreaking tools that are actually enforcing the security of top technology companies such as Fastly. I teach Software Engineer and Language-Based Security at KTH for bachelor and mater programs respectively. During this time, I also supervise master students, all of them currently working for well-settled companies such as Ericsson and Hopsworks.

09/2021 – 12/2021 **Contractor Software Engineer** — **Fastly Inc.**

`Rust` • `WebAssembly` • `Compilers` • `Fuzzing` • `Automatic testing`

I implemented a specific *subproject* for the testing platform in the Fastly WebAssembly compiler. I contributed to the testing pipeline of Fastly through fuzzing. Meanwhile, I was credited a *CVE* found in the Lucet's compiler used by their edge-cloud computing platform.

11/2017 – 3/2019 **Software Engineer/Full stack developer** — **Iberant SL.**

`.Net Core` • `Microservices` • `MsSQL` • `ReactJS` • `Azure` • `Xamarin`

During my time in Iberant, I mostly worked as a full stack developer creating ERP systems. Concretely, we created an event sourcing architecture following the specifications of our clients at that moment. We integrated Azure technologies, and we even created our own DSL implementation to support an easy-to-use IFTTT platform. Besides, I also worked with mobile development technologies such as Xamarin.

2016 – 3/2019 **Assistant professor** — **University of Havana**

After graduating, I received an offer to be an assistant professor at University of Havana teaching Programming Languages and Compiling Theory.

EDUCATION

2019 – 2024 **PhD in Computer Science** — **KTH Royal Institute of Technology**

Relevant courses: Programming for Data Science , Cyber-physical systems safety and security , Introduction to High Performance Computing , Research preparation course in programming languages and formal methods , Advanced Ethical Hacking , Critical Perspectives on Data Science and Machine Learning , Solving Combinatorial Problems with MiniZinc .

RESEARCH

Papers

[1] Javier Cabrera-Arteaga, Martin Monperrus, Tim Toady, and Benoit Baudry.
"WebAssembly Diversification for Malware Evasion".
In: *Computers Security* (2023), p. 103296.
ISSN: 0167-4048.
DOI: https://doi.org/10.1016/j.cose.2023.103296.
URL: https://www.sciencedirect.com/science/article/pii/S0167404823002067.

[2] Javier Cabrera Arteaga.
"Artificial Software Diversification for WebAssembly".
PhD thesis. KTH Royal Institute of Technology, 2022.

[3] Javier Cabrera Arteaga, Pierre Laperdrix, Martin Monperrus, and Benoit Baudry.
"Multi-Variant Execution at the Edge".
In: MTD'22 (2022), pp. 11–22.
DOI: 10.1145/3560828.3564007.
URL: https://doi.org/10.1145/3560828.3564007.

[4] Javier Cabrera Arteaga, Orestis Floros Malivitsis, Oscar Luis Vera Pérez, Benoit Baudry, and Martin Monperrus.
"CROW: Code Diversification for WebAssembly".
In: *Proceedings of MADWeb, NDSS*.
2021.
URL: https://api.semanticscholar.org/CorpusID:237108257.

[5] Javier Cabrera Arteaga, Shrinish Donde, Jian Gu, Orestis Floros, Lucas Satabin, Benoit Baudry, and Martin Monperrus.
"Superoptimization of WebAssembly Bytecode".
In: *Conference Companion of the 4th International Conference on Art, Science, and Engineering of Programming*.
<programming> '20.
New York, NY, USA: Association for Computing Machinery, 2020.
URL: https://doi.org/10.1145/3397537.3397567.

[6] Javier Cabrera Arteaga, Martin Monperrus, and Benoit Baudry.
"Scalable Comparison of JavaScript V8 Bytecode Traces".
In: *Proceedings of the 11th ACM SIGPLAN International Workshop on Virtual Machines and Intermediate Languages*.
VMIL 2019.
New York, NY, USA: ACM, 2019.
URL: http://doi.acm.org/10.1145/3358504.3361228.

Supervised master theses

[1] Anna Skantz.
Performance Evaluation of Kotlin Multiplatform Mobile and Native iOS Development in Swift.
2023.

[2] Djiar Salim.
Securing Trigger-Action Platforms With WebAssembly.
2022.

[3] Adam Benali.
Neural Decompiliation of WebAssembly.
2021.

[4] Camille Fournier.
Comparison of Smoothness in Progressive Web Apps and Mobile Applications on Android.
2020.